5

10

Appendix A: Derive Phantom Weight Formula

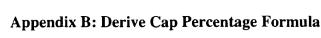
To derive the formula to calculate the phantom weight start with the formula for calculating the capacity a partition's weight represents. We want the capacity represented by the partition's weight to equal the soft cap.

Soft_cap = [Partition_weight / (Σ All_partition_weights + Phantom_weight)] × Capacity

Solve for the Phantom_weight

 Σ All_partition_weights + Phantom_weight = (Partition_weight / Soft_cap) \times Capacity

Phantom_weight = (Partition_weight / Soft_cap) \times Capacity - Σ All_partition_weights



To derive the formula for calculating the percentage of time a partition should be capped start with the formula for calculating the average CPU capacity used by a partition that is capped a percentage P of the time:

$$C_{avg} = P \times C_{capped} + (1 - P) \times_{Cuncapped}$$

Solving for P:

$$C_{\text{avg}} = P(C_{\text{capped}} - C_{\text{uncapped}}) + C_{\text{uncapped}}$$

$$C_{avg}$$
 - $C_{uncapped} = P(C_{capped} - C_{uncapped})$

$$P = (C_{uncapped} - C_{avg}) / (C_{uncapped} - C_{capped})$$

Since we want to calculate P when the average CPU capacity equals the soft cap, replace C_{avg} with $C_{softcap}$:

$$P = (C_{uncapped} - C_{softcap}) / (C_{uncapped} - C_{capped})$$

5

10